

FOREST INSECT AND DISEASE CONDITIONS

INTERMOUNTAIN REGION-1978 1/

by

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CONDITIONS IN BRIEF

Bark beetles remained the primary mortality agent in the Intermountain Region in 1978. Mountain pine beetle activity in lodgepole pine increased on the Boise and Payette National Forests, Idaho, and populations stabilized on the Caribou National Forest, Idaho, and Ashley National Forest, Utah. Infestations decreased on the Targhee National Forest, Idaho, and Bridger-Teton National Forest, Wyoming.

Douglas-fir beetle infestations throughout the Region fluctuated slightly, but tree mortality was essentially the same as in 1977. On the Boise National Forest, expansions in some areas and increased intensity in others overshadowed the reduced number of mortality centers. Douglas-fir mortality on the Payette National Forest generally diminished in severity, whereas mortality on the Salmon National Forest remained static.

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1/ Includes forests in Utah, Nevada, southern Idaho, western Wyoming and eastern California.

Pine engraver beetle activity on the Boise National Forest expanded and intensified over that of 1977. The number of mortality centers on the Payette National Forest increased slightly; however, decreases were also noted in some areas. The rapid increase which occurred in 1977 appears to have reached a plateau.

The first gypsy moth to be trapped in the Intermountain West was collected at Zion National Park in 1978. Gypsy moth was introduced into the eastern United States from Europe and has become a serious defoliator of eastern hardwood species.

Defoliation by western spruce budworm increased to one and a half million acres on six National Forests -- the Bridger-Teton, Boise, Targhee, Salmon, Caribou, and Challis, as well as the Idaho Primitive Area and Grand Teton National Park. However, defoliation on the Payette National Forest decreased in localized areas, as well as Forestwide.

Dwarf mistletoes were the most destructive pathogens to the Forests in the Intermountain Region. A Regionwide survey was conducted to provide incidence and volume loss information due to lodgepole and ponderosa pine dwarf mistletoe. Numerous needle diseases of pine and larch were observed in southern Idaho Forests during 1978. Some tree mortality due to the 1975-1977 drought was observed throughout the Region, mostly in ponderosa pine and spruce stands.

STATUS OF INSECTS

WESTERN SPRUCE BUDWORM, Choristoneura occidentalis Freeman

Defoliation by western spruce budworm increased from slightly less than one million acres in 1977 to one and a half million acres in 1978, as observed during aerial detection surveys. Defoliated acreage increased on the Bridger-Teton, Boise, Caribou, Targhee and Salmon National Forests in Idaho and Wyoming.

The Bridger-Teton National Forest suffered defoliation by western spruce budworm at a level above that in 1976, following a 1977 decrease. The total defoliated area reached 199,550 acres. Major expansions occurred in the drainages of Mosquito, Fall, upper Willow, and lower Granite Creeks.

On the Boise National Forest, defoliation by budworm intensified and expanded from 94,000 to 228,000 acres. Heavy defoliation extended to the perimeter of the host type near Sagehen Reservoir, Emmett Ranger District. Infestations in the Eagle Nest Mountain area on the Cascade Ranger District increased.

Significant changes in budworm defoliation also occurred on the Targhee and Caribou National Forests. Combined, these two Forests have about 90,000 acres with light to heavy defoliation. This represents the first budworm damage reported on the Caribou in recent years. New defoliation on the Targhee is located along the east side of the Big Hole Mountains. The Caribou outbreak, except for a small area of defoliation in Smith Canyon, extends along the east side of the Caribou Range.

The 1978 infestations on the Salmon National Forest in Idaho covered territory similar to that in 1977, with some increased intensity along Panther Creek and the North Fork of the Salmon River drainage. New areas appeared along the Silver Creek drainage and in the Yellowstone Creek and Shovel Creek areas on the southern part of the Forest (183,200 acres in 1978).

In 1977, 500 acres of new defoliation were discovered on Blacktail Butte in Grand Teton National Park, Wyoming, on lands adjacent to the Bridger-Teton National Forest. New defoliation occurred to the north and west of Blacktail Butte in 1978. Defoliation occurs between Phelps Lake and Leigh Lake along the base of the Teton Mountains, visible to Park visitors. The largest area of new defoliation is located in the lower portion of Pilgrim Creek.

Defoliation on the Payette National Forest decreased on the northern portion of the Forest in the Boulder Creek drainage, west of the South Fork of the Salmon River. The Weiser River drainage on the Council Ranger District displayed heavy defoliation over a greater area than recorded in 1977.

Budworm defoliation in the Idaho Primitive Area increased by 47,400 acres to total 338,400 acres. The Primitive Area falls on four National Forests south of the Salmon River; however, it is considered a separate entity for budworm acreage estimates.

A proposal to spray western spruce budworm on the Boise and Payette National Forests in 1978 was evaluated through the NEPA process and an Environmental Impact Statement was written. The operational project was deferred until additional information is obtained.

GYPSY MOTH, Lymantria dispar (L.). In cooperation with APHIS, the Forest Service has conducted a detection survey for the gypsy moth in parts of southern Utah for several years. Pheromone-baited traps were placed in major tourist areas where suitable host trees were abundant. Such areas were selected due to their proximity to major east-west travel routes. A male gypsy moth was trapped in Zion National Park, making this the first collection of this insect in the Intermountain West. Efforts are underway to expand the detection survey to determine if gypsy moth has become established in Zion National Park and to be prepared for population increases. Occasional detections do not necessarily indicate a developing infestation, however.

WHITE FIR NEEDLE MINER, Epinotia meritana Heinrich. Light to heavy defoliation of white fir occurred on approximately 3,000 acres along the East Fork of the Sevier River, Dixie National Forest, Utah. This infestation has persisted for several years, resulting in growth loss and tree damage where heavy defoliation occurs; tree mortality, however, has been light. During 1978, defoliation was recorded in Upper Kanab, Skunk, and Badger Creeks.

PONDEROSA PINE NEEDLE MINER, Coleotechnites sp. Needle miner populations reported in 1977 on the North Fork District, Salmon National Forest, were observed there again in 1978 as well as in the Carmen Creek drainage on private land. A second infestation was found on the Boise National Forest, southeast of Sagehen Reservoir, Emmett Ranger District. Reports of needle mining in ponderosa pine on the Council Ranger District, Payette National Forest, were also received.

FALL CANKERWORM, Alsophila pometaria (Harris). Following a year of reduced defoliation in 1977, the fall cankerworm caused moderate to heavy defoliation around lower Corn Creek on the Fishlake National Forest, Utah, during 1978. Heaviest defoliation occurred on box elder in Adelaide Campground with cottonwood receiving only incidental defoliation.

A TIGER MOTH, Halisidota ingens Hy. Edw. A new infestation of this defoliator was reported on ponderosa pine along Carpenter Ridge, Manti-LaSal National Forest, Colorado. Some top killing has occurred, but the long-range impact is unknown.

SAWFLY, Neodiprion fulviceps Cresson. Heavy defoliation of ponderosa pine in Clear Creek on the Fishlake National Forest continued during 1978. Branch mortality was light, despite many years of repeated defoliation.

LARCH CASEBEARER, Coleophora laricella (Hübner). Approximately 500 acres of defoliation by larch casebearer were detected during an early June aerial survey in the Elkhorn Creek drainage on the Payette National Forest. The Braconid, Agathis pumila (Ratz.), an imported wasp parasite of larch casebearer, was collected in northern Idaho in cooperation with the Idaho Department of Lands and released in casebearer-infested larch stands on the Payette and Boise National Forests, State, and private lands in Idaho. The wasp was not known to occur south of the Salmon River.

BLACK PINE-LEAF SCALE, Nuculaspis californicus Coleman. Populations of this insect started to decline after five years of activity on a 400-acre ponderosa and Jeffrey pine site near Genoa, Nevada. Repeated infestation has resulted in scattered tree mortality. However, examination of five study plots established within the infestation in 1976 indicates that the majority of the defoliated trees are recovering.

The observed mortality occurred primarily as a result of increased populations of secondary insects such as the red turpentine beetle and one or more species of flatheaded borers which have successfully attacked and killed the severely defoliated and drought-weakened trees.



MOUNTAIN PINE BEETLE, Dendroctonus ponderosae Hopkins. Static and decreasing trends in 1978 were prevalent for mountain pine beetle populations on most Forests in Region Four. The Boise and Payette National Forests suffered increased mortality, while the Targhee National Forest and Bridger-Teton National Forest experienced decreased damage.

Increases in mountain pine beetle mortality on the Payette National Forest were observed as an expansion of the infestations around Lost Valley Reservoir, Payette Lake, Johnson Creek, and Paddy Flat. Approximately 28,000 trees were detected during aerial surveys.

Over 23,000 recently-killed lodgepole pine were sketch-mapped by aerial observers on the Boise National Forest. New infestations were noted north and east of Deadwood Reservoir (ca. 10,000 trees) and east of Smith's Ferry (ca. 4,000 lodgepole and ponderosa pine). Many of last year's mortality centers expanded in size, such as the infestations around Graham and near Atlanta, Idaho.

Chronic infestations of mountain pine beetle continued at about the same level as noted in 1977 in the Warm Springs and Big Wood River drainages, Ketchum Ranger District, Sawtooth National Forest. Mountain pine beetle activity continued to decline on the Twin Falls Ranger District. Intensive ground surveys showed a decrease in mortality from 10,000 trees in 1977 to 8,000 trees in 1978.

On the Caribou and Ashley National Forests, mortality remained at a near-static condition. Major centers on the Caribou were found in the drainages of Crow, Georgetown, Stump, Tincup, and McCoy Creeks. Most of the current mortality on the Ashley National Forest occurred in Alma Taylor Hollow, Taylor Mountain, Big Lake, Greendale Junction, and Carter Creek.

Infestations on the Targhee National Forest showed a decrease during 1978. Following a drop from 35 trees per acre infested in 1976 to 19 trees per acre in 1977, losses in the Island Park area were reduced to 13.5 trees per acre in 1978. Over the life of the Island Park infestation, trend plots showed an accumulated loss of 128 trees per acre. This represents the highest mortality caused by the mountain pine beetle in Region 4 during the last 30 years. Elsewhere on the Targhee, mortality has decreased over the past several years and only scattered mortality occurred in 1978. The only exception to the overall decline was found along the northwest side of the Teton Basin Ranger District where mortality increased in stands along the forest fringe.

On the Bridger-Teton National Forest, losses continued to decline, with minor "hot spots" remaining.

Ponderosa pine mortality by mountain pine beetle occurred in a few spots on the Boise and Payette National Forests in Idaho and on the Dixie National Forest in Utah.

DOUGLAS-FIR BEETLE, Dendroctonus pseudotsugae Hopkins. The Douglas-fir beetle caused Douglas-fir mortality over much of the Boise National Forest in 1978; new areas were recorded, with 634 mortality centers observed versus 648 in 1977. Mortality continued along the South Fork of the Payette River from Lowman to Grandjean and along the North and Middle Forks of the Boise River. Expanded mortality occurred along Clear Creek near Lowman and within the Silver Creek drainage east of Boiling Springs. Douglas-fir beetle mortality persists in the areas between Mores Creek and the Boise River westward, and from the North Fork of the Boise River south and eastward.

The Douglas-fir beetle remained the only abundant bark beetle encountered on the Salmon National Forest. Douglas-fir mortality was again recorded in the Panther Creek drainage and the vicinity south of North Fork, Idaho, but was less intense than last year. These areas represent the last vestiges of the epidemic which initiated five areas ago.

Renewed tree killing occurred in Grand Teton National Park along the base of the Teton Mountains between Teton Village and Leigh Lake. This mortality can be seen from many of the scenic turnouts throughout the Park.

PINE ENGRAVER BEETLE, Ips pini (Say). Ips infestations in Boise National Forest ponderosa pine stands continued to intensify, with 290 mortality centers recorded. Several new areas were heavily hit, especially on the west side of the Forest. Large groups of faded ponderosa pine appeared along Dry Buck Creek west of Banks and along the eastern shore of Cascade Reservoir. On the east side of the Forest, new outbreaks of Ips were scattered, with a heavy infestation continuing along Trail, Little Rattlesnake, and Rattlesnake Creeks.

On the Payette National Forest, approximately 6,000 ponderosa pines were attacked in 183 mortality centers spotted from the air. New groups were recorded along the Salmon River near Studebaker Saddle and the Fingers, and increases were noted in the area west of Council along Hornet Ridge. Outbreaks south of Lost Valley Reservoir and along the Little Salmon River declined in 1978.

WESTERN PINE BEETLE, Dendroctonus brevicomis (LeConte). Mortality from western pine beetle was again minimal. Twenty small faded groups were scattered on the Boise National Forest. On the Payette National Forest, 23 mortality centers were noted during aerial detection surveys. Groups of dead trees were found in three major areas: Bear Wallow, Freight Landing, and south of Hornet Ranger Station.

JEFFREY PINE BEETLE, Dendroctonus jeffreyi Hopkins. Mortality in Jeffrey pine on the Toiyabe National Forest, Nevada, and on adjacent State and private lands in Nevada, and California has been slowly increasing since 1975. Widely scattered tree killing occurred throughout the pine type from Mount Ina Coolbrith northwest of Reno, Nevada, south to Bridgeport, California. Group killing of host trees occurred in the southwest corner of Dog Valley; in the Winter Creek drainage near Washoe City; along the east side of Tahoe Basin from China Garden to Lincoln Park; and in several locations in the vicinity of Markleeville, California.

Increases in insect-associated mortality over the last four years is thought to be, in part, a result of extreme drought conditions which occurred from 1974 to 1977. Ground surveys indicate that the majority of mortality is occurring in areas which are marginally productive because of rocky, coarse-textured, or thin soils which have a low moisture-holding capacity.

WESTERN BALSAM BARK BEETLE, Dryocoetes confusus Swaine. Mortality of subalpine fir caused by this bark beetle increased throughout Utah, Wyoming, and southeast Idaho during 1978. Two major concentrations occurred along the west slopes of the Escalante Mountains and in the Teton Wilderness area.

### STATUS OF DISEASES

DWARF MISTLETOE, Arceuthobium spp. A Regionwide survey was conducted to assess the incidence of and cubic-foot volume loss due to lodgepole pine dwarf mistletoe (Arceuthobium americanum Nutt. ex Engelm.) and ponderosa pine dwarf mistletoe (A. campylopodum Engelm. and A. vaginatum sub sp. cryptopodum (Engelm.) Hawks and Weins). Douglas-fir stands were also surveyed for dwarf mistletoe (A. douglasii Engelm.) for future analysis with proposed Douglas-fir yield simulation models. The survey consisted of two parts -- a roadside rating and plot inspections. About 3,500 miles of roads within 13 Forests were surveyed, with temporary plots established every three miles. The survey information is currently being processed. An additional survey on the Dixie National Forest will also add to the Regional dwarf mistletoe loss assessment information.

A pre-suppression survey on the Payette National Forest was conducted to evaluation proper dwarf mistletoe control on 150 new and old clearcut areas. The initial results indicate that dwarf mistletoe control is being satisfactorily effected through normal silvicultural procedures.

Forest Insect and Disease Management surveys and funding were also provided in 1978 to support dwarf mistletoe control projects on five National Forests. A total of 4,530 acres of forested land was protected from future mistletoe infection through sanitation and overstory removal projects.

LODGEPOLE PINE NEEDLE CAST, Lophodermella concolor (Dearn.) Dark.

Many areas of lodgepole pine on the Payette, Boise, Challis, and Salmon National Forests in Idaho experienced a widespread needle cast epiphytotic. Some areas show needle loss annually back to 1974. Light mortality of seedlings and saplings was observed in some of the more heavily infected stands.

ELYTRODERMA NEEDLE CAST, Elytroderma deformans (Weir) Dark. This disease was scattered in ponderosa stands on the Boise and Payette National Forests as well as on other ownerships. Heavy occurrence of witches' brooms and single red-brown flags were observed in Long Valley, around Warm Lake, in the Squaw Creek and Boise River Drainages, and in Moores and Grimes Creeks.

GREYBEARD, Lophodermium sp. This needle disease was observed on the Boise and Idaho City Ranger Districts, Boise National Forest, but is believed to be widespread throughout the ponderosa pine type on this Forest. Signs of disease in the areas of Grimes Creek, Moores Creek, and the North Fork of the Boise River included persisting grey, dead interior needles and incidental mortality of sapling and pole-size ponderosa pine.

WESTERN LARCH NEEDLE CAST, Meria laricis Vuill. Scattered areas of infection by this needle cast were observed in western larch on the Boise and Payette National Forests. Infections occurred in the interior lower portions of the larch crowns.

DUTCH ELM DISEASE, Ceratocystis ulmi (Buisman) C. Moreau. Contingency plans were drafted and submitted to the States of Utah and Nevada, as these States currently do not harbor the wilt fungus. Several assistance calls were made during the field season to examine trees thought to have the disease, but laboratory and field studies did not corroborate any new areas of infection. The State of Utah is completing an inventory of street tree species.

DROUGHT DAMAGE. The drought of 1974-1977 caused direct mortality to some trees on poorer sites. In the spring of 1978, an evaluation was made on about 500 acres of Jeffrey/ponderosa pine west of Washoe Valley, Nevada. Dead and dying trees were located along an environmental ecotone that represented the interface of a sagebrush/mountain mahogany-dominated grassland with a Jeffrey/ponderosa pine forest. Along the interface, the pine was not in a self-reproducing capacity.

Dying trees were noticeably wilted in appearance. The older needles abscised prematurely and fading was more pronounced on the side of the tree that received direct sunlight.

No primary pathogens or insects were found. Therefore, it is believed that the observed mortality was a result of extreme water stress resulting from a depletion of ground water occurring during periods of subnormal precipitation.



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Survey information is summarized in Table 1 preliminary to a report on the effects of lodgepole pine dwarf mistletoe.

Table 1. Incidence and cubic foot volume loss estimates due to the impact of dwarf mistletoe on lodgepole pine forests in Region 4. Information based on 1978 plot surveys and the RMYLD simulation model.

National Forest	Percent of Lodgepole Pine Plots with Dwarf Mistletoe	Annual Cubic-foot Volume Loss Due to Dwarf Mistletoe
Ashley	58	3,304,455
Boise	57	1,598,052
Bridger-Teton	67	3,195,936
Caribou	68	2,290,318
Payette	50	1,460,868
Salmon	59	4,965,080
Sawtooth	71	3,798,757
Targhee	79	6,066,900
Wasatch	34	1,600,066
TOTAL		28,280,432

\*The Humboldt, Toiyabe, Fishlake, Dixie, Manti-LaSal, and Uinta National Forests have little or no forest acreage in the Lodgepole pine type and thus are excluded from this Table.

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DROUGHT DAMAGE. The drought of 1975-1977 was responsible for some tree decline and mortality on poor sites. For instance, dead and dying Jeffery/ponderosa pine were found concentrated in a 500-acre area west of Washoe Valley, Nevada. The area is located at the base of a mountain range where the pine forest gives way to sagebrush dominated rangeland.

Symptoms associated with the drought stress included the wilted and faded needles on the dying trees which was more pronounced on the side of the tree exposed to the sun. Mortality was most severe in those trees that bordered a stand, particularly on the south-facing slopes.

No primary pathogens or insects were found. Therefore, it is believed that the observed mortality was a result of extreme water stress resulting from a depletion of ground water occurring during periods of sub-normal precipitation.

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